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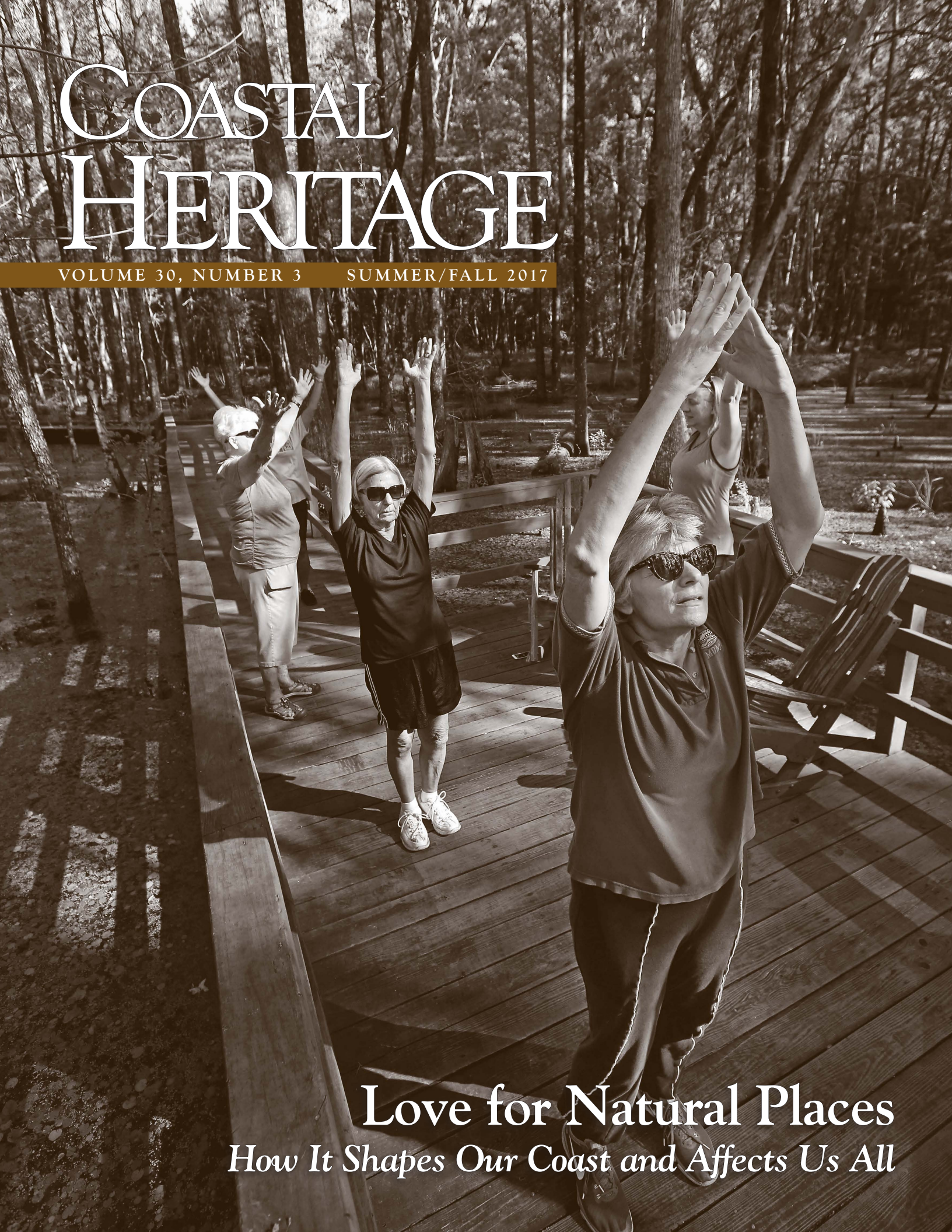

Love for Natural Places

How It Shapes Our Coast and Affects Us All

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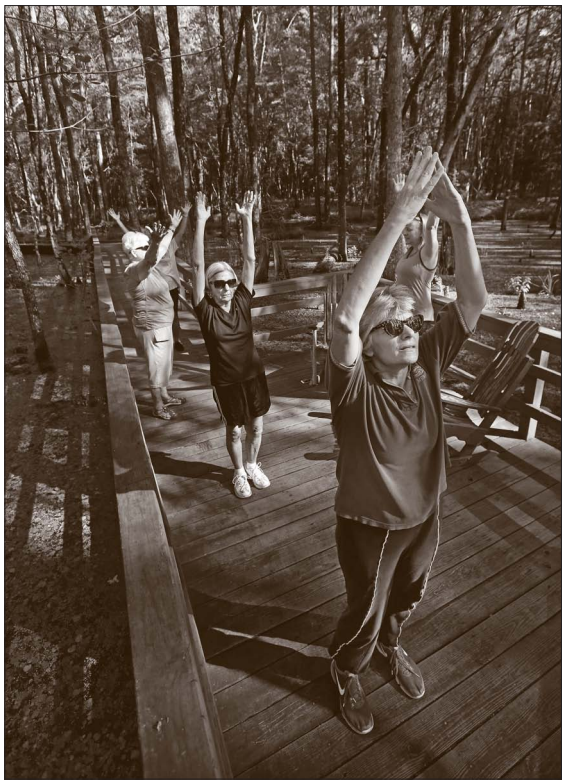

ON THE COVER:

Participants in the Walk and Restorative Yoga program at Caw Caw Interpretive Center near Ravenel are adherents of the healthy benefits of spending time in natural settings.

PHOTO/GRACE BEAHM ALFORD

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Coastal Heritage is a quarterly publication of the S.C. Sea Grant Consortium, a science-based state agency supporting research, education, and outreach to conserve coastal resources and enhance economic opportunity for the people of South Carolina. Comments regarding this or future issues of ***Coastal Heritage*** are welcomed at Joey.Holleman@scseagrant.org. Subscriptions are free upon request by contacting:

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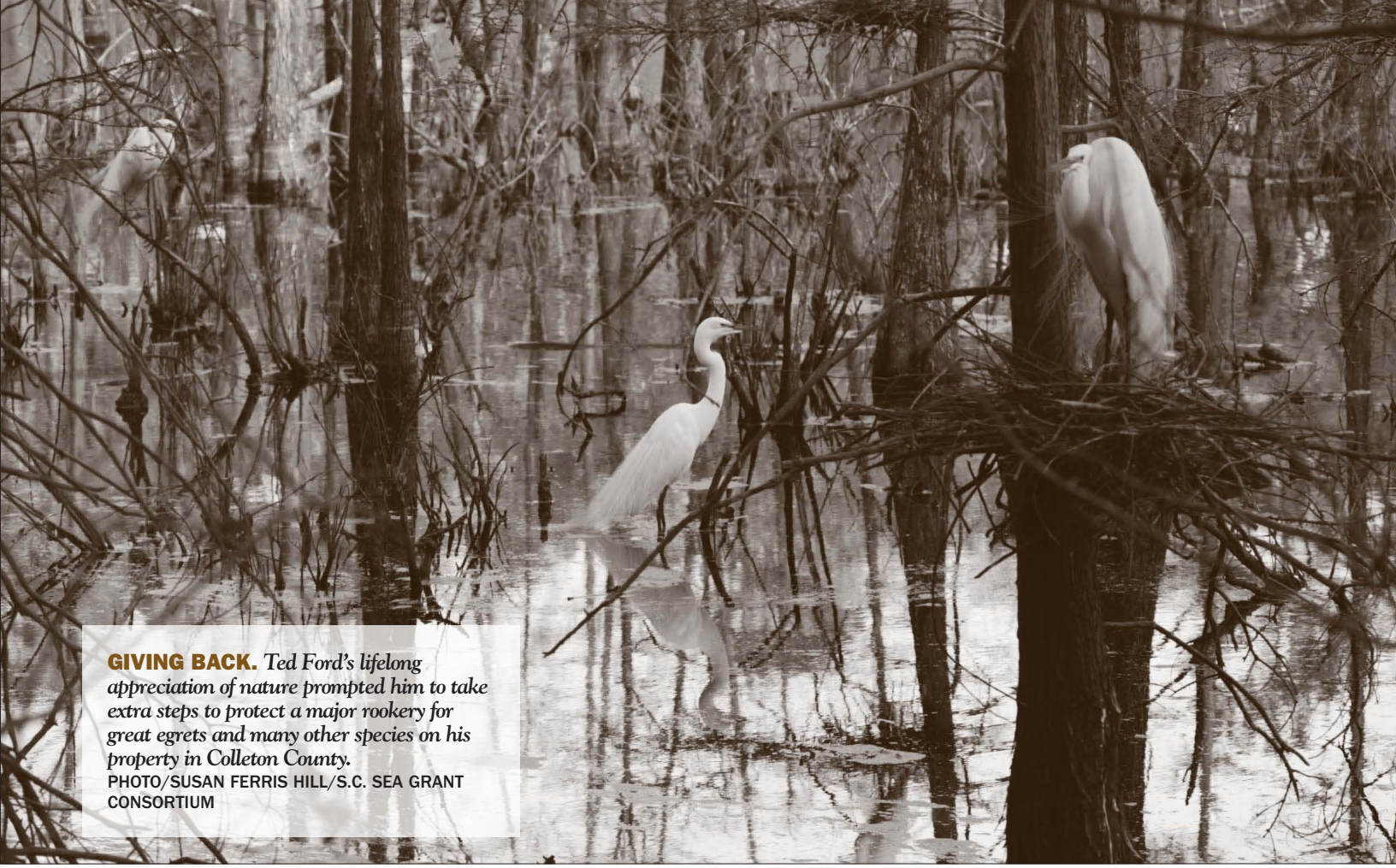


GIVING BACK. *Ted Ford's lifelong appreciation of nature prompted him to take extra steps to protect a major rookery for great egrets and many other species on his property in Colleton County.* PHOTO/SUSAN FERRIS HILL/S.C. SEA GRANT CONSORTIUM

Love for Natural Places

How It Shapes Our Coast and Affects Us All

by Joey Holleman

South Carolina's coastal residents revel in the natural world that envelopes them, whether fishing in saltwater creeks, hunting waterfowl on former rice impoundments, or simply taking in the sights from the marshes to the upland pine forests.

The land and water returns the embrace, providing homes for wildlife, relief from the stress of day-to-day life, and venues for activities that make hearts and minds fulfilled.

That mutual affection is a coastal way of life – love our natural areas, do something to make them healthier, and their renewed embrace will make you feel better.

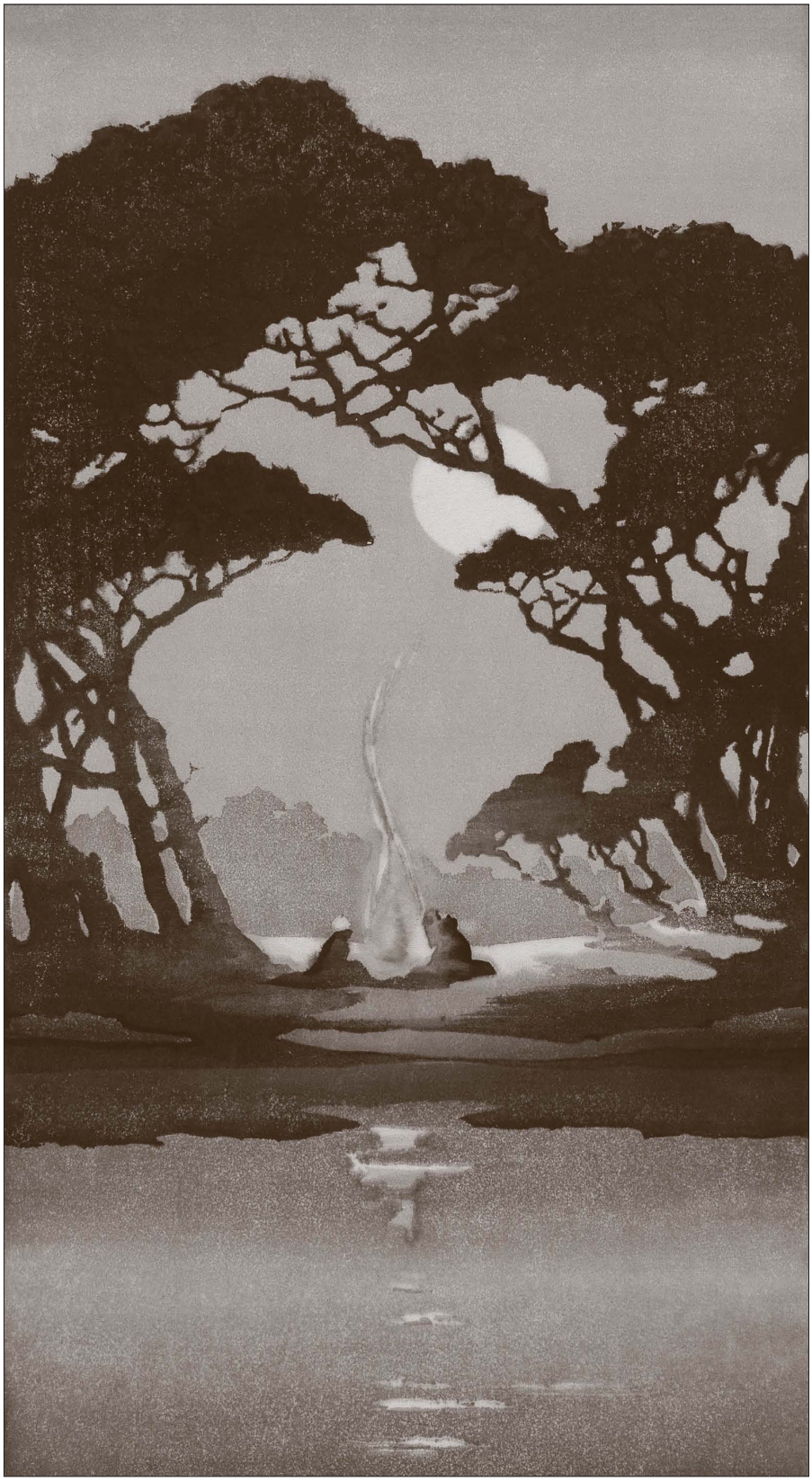
This healthy symbiosis harkens back to pre-European days, when native tribes along the coast moved their inland villages from time to time to let the soil in agricultural plots recover nutrients. They also set fires in surrounding woodlands, recognizing that cleared understory improved the health of forests.

When Europeans arrived, however, coastal landscapes became more important as a spur for commerce. Trees were cut for timber and naval stores and to make way for fields of cotton, and dams and dikes were built to direct freshwater into rice fields.

Well into the late 1800s, coastal residents hunted and fished to gather sustenance, and they paddled canoes as their means of transportation. Landowners in that period viewed "the natural world as something to exploit, and if exploitation opportunities were not readily obvious, then it was a wasteland," says Shawn Halifax, coordinator of historical interpretation for the Charleston County Park and Recreation Commission.

Tidal marshes and cypress swamps were bug-infested places to avoid, except when gathering oysters or planting and harvesting sea island cotton and rice.

There were exceptions. Elizabeth Allston Pringle wrote lovingly in *Chronicles of Chicora Wood* about the flowers ringing the wetlands at her family's plantation in Georgetown County in the middle 1800s. Her brother Charley's reaction when her



ENTICING IMAGES. *Popular culture in the early 1900s helped draw people to natural settings, such as depicted in Moonlight on the Cooper River, ca. 1919, by Alice Ravenel Huger Smith (American, 1876 –1958); Woodblock print on paper, 15 1/8 x 7 inches.*
IMAGE COURTESY OF THE GIBBES MUSEUM OF ART/CAROLINA ART ASSOCIATION/GIFT OF ALICE RAVENEL HUGER SMITH

family regained control of Chicora Wood after the Civil War, however, was more typical of the times. "It was the greatest happiness to him that we were moving back to Chicora, and that he was going to plant the place," she wrote.

In the early 1900s, appreciation for the natural world began to change, Halifax says. The national conservation movement pushed by John Muir and Teddy Roosevelt took hold. Soon the federal government was buying critical land to protect natural landscapes, first as national parks but later as national forests and wildlife refuges.

Around the same time, the watercolors of Charleston's Alice Ravenel Huger Smith invited people to experience the fanciful wildlife and ethereal beauty of South Carolina's cypress swamps, and McClellanville's Archibald Rutledge's short stories poetically extolled the state's coastal creeks and hummocks.

"The foliage on the overhanging live-oaks is always lustrous; the coloring on the water-oaks is brightest in mid-winter; the cypresses and tupelos and gums are festooned with Spanish moss, and with riotous plumy sprays of smilax and yellow jasmine," Rutledge wrote in *Paddling Them Up.*

"Here and there along the shore are glimmering sandbars, dim receding bays, estuaries retiring mistily into alluring thickets of sweet myrtle, towered over by momentous pines."

APPRECIATION FOR NATURE DEEPLY ROOTED IN COASTAL SOILS

Also in the early 1900s, a renewed obligation to care for special natural places began to grow in South Carolina, as detailed in Virginia C. Beach's 2014 book *Rice and Ducks: The Surprising Convergence that Saved the Lowcountry.*

The trend began when land speculators, some local residents but many from the northern states, began buying up former plantations from cash-starved owners after the Civil

War. Without free labor by enslaved workers, the economy of large cotton and rice plantations had failed. But vast landholdings could be managed as hunt clubs less expensively, and controlled flooding of former freshwater rice impoundments created ideal stopovers for migratory waterfowl.

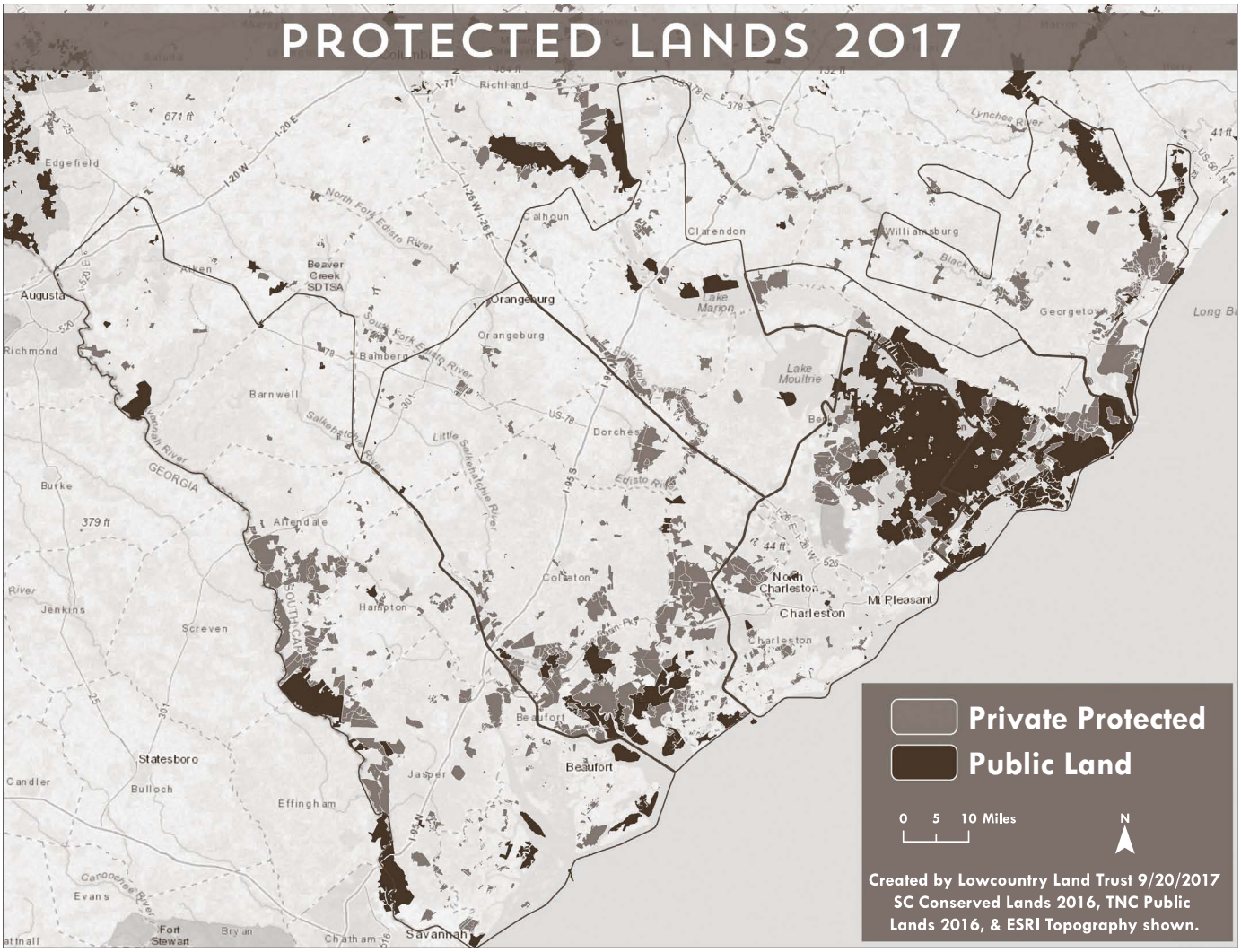
Beach wrote "the Yankees of the second northern invasion" worked with locals to "rescue a landscape and a culture." They didn't come south to rescue a landscape; they made the investment because they appreciated romping in nature after waterfowl, quail, or deer.

But they also fell in love with the land. Wall Street financier Bernard Baruch often retreated to Hobcaw Barony, land he had purchased in Georgetown County. Spending time in the natural setting "helped clear my mind and refresh me physically for any future actions," he wrote.

The hunt club trend also meant large parcels hadn't been broken up into smaller estates. Those tracts were available along South Carolina's coast when the federal government, prompted by the growing conservation movement, decided to begin protecting wild places in the 1920s. Between 1927 and 1936, the government purchased more than 9,000 acres of former rice lands to start Savannah National Wildlife Refuge along the Georgia border. It has since grown to 29,000 acres.

In 1930, portions of 13 plantations were purchased for the original 33,000 acres of Cape Romain National Wildlife Refuge, now covering 66,000 acres in northern Charleston County. From 1933-1936, the federal government bought almost 400,000 acres for national forests in South Carolina, including the coastal portion of Francis Marion National Forest.

Some landowners elected to protect their land from development themselves. Archer Huntington, heir to a northern railroad magnate, and his wife Anna set up a legal framework in 1931 that led to their nearly 9,000 acres becoming Brookgreen Gardens and Huntington Beach State Park. Belle W. Baruch, Bernard's



SAVING SPACES. *In a trend that traces back to early 20th century hunt club owners, more than 1 million acres – or nearly 22 percent of the land in coastal South Carolina – is protected from development by conservation easements or public ownership.*
MAP/LOWCOUNTRY LAND TRUST

daughter, in 1964 designated 16,000-acre Hobcaw Barony as a research facility, now shared by Clemson University and the University of South Carolina. Santee Gun Club donated 23,000 Santee delta acres in 1974 to The Nature Conservancy (TNC), which eventually turned the land over to the S.C. Department of Natural Resources (SCDNR). Boston Red Sox owner Tom Yawkey in 1976 willed most of three islands, nearly 20,000 acres, at the mouth of Winyah Bay to SCDNR.

South of Charleston, in the vast drainage of the Ashepoo, Combahee, and Edisto rivers, private protection came later and took a different track. In the 1980s, the possibility of a large marina development on the Edisto River prompted local landowners and conservation groups to come up with a plan to blunt urban sprawl. They would utilize conservation easements, which allow landowners to give up development rights on their property in return for future tax benefits. The plan depended on landowners having an appreciation of natural areas they owned that superseded their desire to profit from the property's sale.

Ducks Unlimited (DU), TNC, and SCDNR provided funds and expertise, and Senator Ernest Hollings made sure the federal government was a strong partner in what became known as the ACE Basin initiative. By 2015, more than 217,000 acres of the 350,000-acre ACE Basin were protected either under conservation easement or as government-owned property.

"It set a standard of how to get conservation done on a large scale through collaboration between private landowners, conservation groups, and government agencies," says Mark Robertson, executive director of TNC's South Carolina chapter.

This was coastal South Carolina's 20th century version of symbiosis. People decided to make sure the wild places they owned stayed inviting to the plants and wildlife that drew them there in the first place. In the eight coastal counties, slightly more than 500,000 acres of private property were under some form of easement by 2017, according to Lowcountry Land Trust.

"People call us and say 'I own this property. It was given to me by my mother or my father or my grandfather, and I want to protect it,' " says Ashley Demosthenes, president and chief executive officer of Lowcountry Land Trust. "They understand there are some tax benefits. But mostly they love this place, and they realize their land can contribute to what they love."

Add in state and federal property, and more than 1 million acres, nearly 22 percent of South Carolina's coastal land, is protected. The protected property serves as buffers to development north and south of the Charleston metro area as well as havens for wildlife.

GIVING BACK: "ISN'T IT JUST THE RIGHT THING TO DO?"

Of course, protecting land isn't the only way to give back to nature. Eugene DuPont, who used to travel from his home in the Philadelphia area to hunt on his family's nearly 10,000 acres on the Combahee River along U.S. 17, embraced managing land for the benefit of wildlife.

DuPont's legacy lives on in the Nemours Wildlife Foundation, formed shortly before his death in 1995 with the dual purpose of preserving his coastal property and using it as a training ground for wildlife property managers. Interns who came through the Nemours program now manage several major SCDNR Wildlife Management Areas.

"Most students in wildlife biology

LOVE BIRDS. *When he first bought his recreation property in Colleton County, Ted Ford couldn't believe the number of birds like these great egrets that flocked to his pond. They turned him into a bird watcher.*
PHOTO/SUSAN FERRIS HILL/S.C. SEA GRANT CONSORTIUM

are coming from an urban environment," says Mike McShane, Dupont's son-in-law and a former chairman of the SCDNR Board. "They're exposed to the coastal ecosystem in classrooms.

"We thought this would be a wonderful way to start education outreach and bring undergraduate and graduate wildlife management students here to learn. They could learn about how a rice field trunk is built, how to manage it with the tides. They can't learn that in a classroom."

The forests on James Island were classrooms for Ted Ford, who grew up in the 1960s when the island was a sleepy Charleston suburb where houses shared space with natural areas. "I would come home from school and get the beagle and go out rabbit hunting," he says. "I'd just find the first thicket and hunt there. That became my identity and was the start of my becoming an outdoorsman."

Like many hunters, he went through the taking stage as a young man and graduated to the give-back stage. In 2004, Ford bought a 475-acre tract on the Little Salkehatchie River in Colleton County as a recreational getaway, mainly for hunting. He knew birds used the 50-acre pond on the property as a roost, but he had no idea how many flocked to the pond.

"I was getting ready for a turkey hunt on a neighbor's property and went to look at my property, and the pond was just full of birds," Ford says. "Holy moly! There were thousands of birds."

There were white ibis in huge numbers, and also little blue , green , night , and egrets. Wood storks, only recently re-establishing their population in the state, love the sturdy branches of the pond's cypress and tupelo trees.

Birds roost in spring and summer, looking from a distance like thousands of white ornaments, their numbers doubled to the eye because of the reflection in clear water below. Alligators in the pond keep away raccoons and other egg predators.

Ford realized with that initial discovery he had one of the largest rookeries in the state, and he felt a massive responsibility. Experts at the SCDNR, DU, and the U.S. Fish and Wildlife Service helped him put together a management plan that includes maintenance of the pond's dam and levee system and the careful use of herbicides in the roosting off-season to keep the pond clear of algal species that could impact birds.

Managing the pond for birds requires a lot of effort and money, but Ford never considered any other option. "Not to be camp about it," he says, "but isn't it just the right thing to do?"

EDUCATED VOLUNTEERS. ***Guidebooks stacked on a table at Caw Caw Interpretive Center await the next class of South Carolina Master Naturalists, who spend 12 intensive days learning about the local flora and fauna, then apply their knowledge through volunteer work.***
PHOTO/GRACE BEAHM ALFORD

OTHERS GIVE BACK AT THEIR OWN SCALE

Despite the conservation movement, exploring nature simply for enjoyment remained mostly an upper-class experience until economic and technological advances in the second half of the 20th century built a middle class with more time for leisure activities.

By the early 21st century, hunting and fishing were as much about having fun as about gathering food. In a 2006 survey by natural resource polling organization Responsive Management, 22 percent of hunters listed meat as the primary focus of their time in the field, while 61 percent cited recreation, family time, or to be close with nature.

Meanwhile, many more people began hiking coastal trails or paddling waterways in canoes or kayaks, simply to enjoy interacting with and viewing wildlife.

The growing ranks of nature lovers do what they can to embrace the places they explore. Hundreds each year go through training to become South Carolina Master Naturalists, a Clemson Extension effort. They study flora and fauna in 12 all-day sessions spread out over three months. They also are required to perform 30 hours of volunteer work, and for many that's just the start.

Master naturalists have formed a cadre of citizen scientists and volunteers who help with projects. In the Georgetown area, they help the Waccamaw Riverkeeper take water-

ISLAND STYLE. *When he's not cooking at his Gullah Grub restaurant on St. Helena Island, Bill Green works with local youngsters to encourage appreciation of Gullah culture, simple foods, and the land and water around them.*
PHOTO/JOEY HOLLEMAN/S.C. SEA GRANT CONSORTIUM

quality samples and assist SCDNR in monitoring sea turtle nests. In the Charleston area, they lend their labor to oyster-reef restoration programs and an effort to rescue least tern chicks that fall from urban nests.

"Every group that takes volunteers loves to have master naturalists because we have the education and can speak about the environment, and we have shown the dedication to go through that class and come out and volunteer," says Debbie Seabrook, president of the Coastal Master Naturalist Association in Charleston.

Bill Green was a master of natural settings long before the master naturalist program began. Growing up in an African-American enclave on James Island, he hunted, fished, and plucked oysters as a child. An expert horseman and dog handler, he went on to lead hundreds of organized deer and fox hunts, mostly in the swamps and pine forests around Middleton Place near Charleston.

With a powerful voice and the lyrical syntax of the Gullah sea island culture, he's also an acclaimed storyteller.

"I had a horse name Mike," Green says. "If I didn't feel good in the mornin' time, he give me a break. If he jump somethin', he take it easy with me until I get my head right.

"Me and him became the strength of the hunt for many years. People want to know how I get there quick to keep the hounds on the line. It's because he know, an' I know how to listen to him."

Green and his wife Sara Reynolds Green now run Gullah Grub restaurant on St. Helena Island, and conduct back-to-nature classes for young people. "We work with the kids, teaching them how to live off the land, how to use the creek, how to share love and kindness," Bill Green says. "If we can really get the kids involved, we can get them back on the creek and back on the farm."

In his upper 60s, Bill Green is working with youngsters growing up a couple of generations after he did. He finds them all too often looking down at their smart phones instead of out at the natural world around them. But not all younger folks are so oblivious to what they have outside those small screens.

Thirty-year-old Casey Davidson has an old soul when it comes to coastal natural areas. He grew up in the Beaufort area in a family that has been working in saltwater creeks and offshore waters for generations. "I learned to throw a cast net when I was six or seven," Davidson says. "The whole culture of my family is shaped by the coast and shaped by the water because that's all we've ever known or done."

Davidson considered going to law school before landing an internship during college with the Coastal Conservation Association, a marine resources advocacy group. That led to a job with a fishing equipment manufacturer. He left that role last year to start his own company, Toadfish Outfitters, in part because he wanted to do more to give back to the natural areas so special to him.

Toadfish's first product is an ergonomic oyster knife, and Davidson donates a portion of the proceeds from each knife sold to an oyster restoration program. He also tries to spread awareness. When he shucks oysters at events to demonstrate his knives, he explains the loss of oyster habitat and the need for restoration.

"You wouldn't believe the number of people I talk to who have no idea that when you eat an oyster you take the shell and you recycle it," Davidson says. "You put it back in recycling centers around the state, and then they put that shell back into the habitat, and it grows oysters. I think there's just a big educational gap now with the diversity from all over the world living here."

The Gullah term for those coming here from elsewhere is comyas. The owners of Sea Kayak Carolina fall in that category. Joe Campbell grew up in Boston and moved here from Atlanta. Bev Cosslett is originally from Colorado and came to Charleston from New York. They both settled in this area in part for its wealth of nature-based recreation possibilities,

especially paddling.

When Campbell first drove over from Atlanta to try coastal kayaking, "I found a Sea Kayak Carolina meet-up group, and through them got hooked," he says. "They welcomed me with open arms."

When the previous owners decided to sell the business, Campbell partnered with Cosslett to buy it. The move has worked out well. Not only do they have kayaking knowledge, they understand the viewpoint of the out-of-state tourists looking to experience the coast from the water.

"I love taking people out on the water who haven't been exposed to watersports and showing them they can do it," Cosslett says. "It changes them. They start out scared. Then they see they can do it and it relaxes them. Then they can appreciate their surroundings."

IN RETURN, NATURE SERVES AS THERAPY

At an international tuberculosis conference in Paris back in 1888, Dr. R.C.M. Page, a professor at New York Polyclinic Medical School, touted the health benefits of coastal South Carolina.

"If the patient has heart complications with lung trouble, by no means send him to high altitudes, or he will probably die," Page said. "Do not send him either to Florida, where damp fogs are pretty sure to do serious harm. In any case choose rather among low, dry altitudes, in a pine region, where the air is charged with derivatives of turpentine; I refer to such places as Summerville, South Carolina."

This came at the height of the sanitarium movement, when people from urban areas were retreating to resort-like facilities, often in mountain settings, to relieve all manner of illnesses. The science behind Page's claim was weak, but Summerville inn owners latched onto the comment and used it in advertisements in northern newspapers.

More than a century later, researchers increasingly are revealing the scientific validity of that early back-to-nature movement — not the dry vs. damp environment or turpentine-infused air, but the general curative powers of spending time in natural areas. It's all in our heads.

Eva Selhub and Alan Logan detail the research in *Your Brain on Nature: The Science of Nature's Influence on Your Health, Happiness, and Vitality.* With recent technological breakthroughs in functional magnetic resonance imaging and electroencephalograms, scientists can track activity inside the brain. When research volunteers are shown nature views, an anterior region of the brain high in opiod receptors becomes particularly active. A forest or a marsh really can be your physiological happy place.

These findings dovetail with studies that revealed a 40-minute walk in a forest, or even a window in a room with a natural view, can improve mood, increase vigor, and reduce stress. Much of the leading research in this field has been done in Japan, growing out of a recent health movement called shinrin-yoku, or forest bathing.

Another hotbed of nature-as-healer research is Great Britain, home to Green Gym and Blue Gym movements that encourage volunteering and exercising in natural settings. In

GROWING INTEREST. *The ways people interact with nature in South Carolina keep evolving, with nearly 4,500 kayaking enthusiasts packing James Island County Park in recent years for the Charleston Outdoor Fest and East Coast Paddlesports Symposium.*
PHOTO/JOEY HOLLEMAN/S.C. SEA GRANT CONSORTIUM

one study, researchers created a smartphone app called Mappiness, which at random times asks users how happy they are and then uses GPS technology to map their location. About 22,000 participants downloaded the app, and they logged 1.1 million responses. Simply being in marine and coastal areas boosted happiness levels by 5.2 percent.

"The brain is absolutely influenced by nature, and it is no longer an option to write off the philosophers and poets as mere romantic dreamers," Selhub and Logan wrote. "Our perception of stress, our mental state, our immunity, our happiness, and our resilience are all chemically influenced by the nervous system and its response to the natural environment."

Paul Sandifer, director of the College of Charleston's Center for Coastal Environmental and Human Health and a former director of SCDNR, believed in the concept before shinrin-yoku and blue gyms became trendy.

When Sandifer was a child, his older brother contracted polio. The family physician suggested spending as much time in the water as possible to deal with muscle weakness caused by the ailment. So the family spent the summer at Pawleys Island, where his brother could swim all he wanted. The painful symptoms were relieved, and Sandifer would forever swear by the restorative powers of the coast.

"It's interesting to see evidence from the medical profession is beginning to prove that idea," Sandifer says. "They're putting real science on what people have known intrinsically for many, many years."

The benefit of spending time in natural areas is difficult to put into words, like defining love. But those who love coastal South Carolina's natural wonders are well aware they benefit from the relationship more than the environment they work to protect.

Toadfish Outfitters' Davidson teared up trying to describe his attachment to the coast. "It's 5:30 a.m., and I'm pushed back into a creek, and the sun's rising," he says. "Even if you don't catch a fish, you're looking out and a blue heron lights, or you see dolphin strand feeding, or a redfish tail pops up in the grass. It's in your soul. It renourishes you."

McShane, in describing a morning in former rice fields at Nemours Plantation, says "seeing a sunrise over the ACE Basin is affirmation of a greater being."

Green talks of walking long dirt roads shaded by live oaks along the Ashley River or on St. Helena Island. "I'm in an area that's so quiet and sacred and peaceful. It gives my mind a chance to open up. It's the simple stuff you don't have to have a million dollars to enjoy."

Seabrook, the master naturalist who has lived in the Charleston area since her early childhood, considered taking a job in Washington, D.C., a few years ago. But then she recognized the restorative powers of the S.C. coast and turned down the job.

"I went up and looked for a place to live, and I felt bad," she says. "I came back to Charleston and smelled pluff mud, and I felt better. I just had homesickness, and pluff mud cured it."

A dozen of the next generation of potential pluff-mud enthusiasts gathered at Folly Beach County Park on a summer morning for the last day of Clemson Extension's 4-H20 summer camp. The youngsters had spent the week exploring coastal watersheds. They paddled canoes in Four Holes Swamp, pulled seines at Folly Beach, and got to witness the magnificence of a painted bunting up close at Botany Bay Plantation Wildlife Management Area. They also learned how the swamp serves as a filter to clean water, how plastic pollution harms wildlife, and how erosion impacts coastal islands.

The campers entered the week with an appreciation for the nature and came away with a better understanding of their obligation to care for their coastal home. Cravens Kapluck, for instance, is an avid fisherman. The camp made the 13-year-old think about ways to give back to the natural world he wants to spend time in. He's

BIRD WATCHERS. *Paul Koehler (right) and Mackenzie Keohane, participating in the Audubon Society's Christmas Bird Count, are among the advocates of getting out in natural areas simply to view wildlife.*
PHOTO/GRACE BEAHM ALFORD

BUDDING NATURALISTS. *Clemson Extension's 4-H2O summer camp is designed to foster the next generation of nature lovers who will do their part to protect beaches, forests, and swamps along our coast.*
PHOTO/GRACE BEAHM ALFORD

leaning toward a career in engineering. Seeing the damage Hurricane Matthew did to the beach at Botany Bay made him consider working in erosion control.

COULD OUR AFFECTION FOR NATURAL AREAS BACKFIRE?

Some coastal residents fear we could love our natural areas to death. Photographer Susan Roberts is among those. She grew up in Delaware and fell in love with Edisto Island when scouting a place to retire with her husband in the 1980s.

"I was drawn by the ocean, the creeks, the marsh, the live oaks, the Spanish moss, and just the relative undeveloped nature of it," Roberts says. "We sailed down here and anchored the boat in the marsh. It just happened to be one of those incredible nights when the sun sets on one side and the full moon rises on the other side. That just clinched it."

Roberts' photographs are infused with her deep appreciation of the unspoiled natural areas of Edisto Island and the ACE Basin. She worries about the future of some of the island's special places, especially Botany Bay Plantation.

The 3,363-acre site, deeded to SCDNR by a private landowner, was opened to the public in 2008. The public stormed in, nearly 50,000 in the first year. That pales in comparison to the 350,000 annual visitors to neighboring Edisto Beach State Park, but Botany Bay has dirt roads, limited parking, and no public bathrooms.

"Fifty-thousand visitors is a significant number for one of our properties," says Phil Maier, director of coastal reserves and outreach for SCDNR. "The property we manage isn't like state parks. Don't expect amenities. You're getting a look at outdoors South Carolina."

Most Botany Bay visitors simply

CLOSER LOOK. *Taj Barthelmas examines the results of a net dipped in the shallow water at Folly Beach, where finding small creatures just beneath the sand sparked the interest of 4-H20 campers.*
PHOTO/GRACE BEAHM ALFORD

walk the short causeway to one of the state's few easy-to-access undeveloped beaches. Others try fishing in the freshwater ponds, kayaking in the meandering marsh creeks, and hiking to the various natural and man-made highlights on the property. The plantation is part of the agency's Wildlife Management Area program, and special hunts are scheduled several times a year.

Crowds forced some tweaking. Early visitors were allowed to take a small bucket of shells from the beach. Before long, the beach went from shell-rich to shell-poor, and managers had to ban the taking of shells.

Reaction to the ban was more whimsical than angry. Visitors began using the largest shells to decorate driftwood on the beach. Lines of whelks form spines on long logs. Other shells perch on the fronds of palmetto trees. It was an infectious way to celebrate the beach's shells without hauling them off.

The love for the place showed as volunteers flocked to Botany Bay, offering to assist any way they could. About 100 volunteers regularly perform cleanups, present educational programs, and even provide historical preservation expertise for the plantation's old structures.

Attendance has grown to the 70,000-a-year range, but the property seems to be handling popularity well, Maier says. The beach remains a hotbed for sea turtle and shorebird nesting, though damage to the beach by Hurricane Matthew in 2016 impacted those uses.

Before Botany Bay was turned over to SCDNR, Roberts was recruited by the former owner to compile images for a photo album. She learned to appreciate the unspoiled beauty. The rapid reduction in the beach's shell inventory after the area was open to the public saddened her, and she was glad when SCDNR forbid shell collection. With those sorts of limitations firmly set, she thinks opening places like Botany Bay to the public can be a positive.

"If people are having the opportunity to see this and appreciate nature," Roberts says, "that's a good thing."

Botany Bay shows the delicate balance between loving something and loving it to death, especially on the margins where urban growth meets natural areas.

From his days with SCDNR, Sandifer knows the quandary of determining a property's, or the coastal zone's, carrying capacity. The challenge is finding ways to allow people to interact with natural areas and use them but not use them up. "I'm an optimist by nature, so I'm optimistic that most people will realize there are limits to what we can do to these places," Sandifer says. "But I'm pessimistic that we don't have regulatory measures in place to support that."

Counties and municipalities can help determine the density of development near natural areas with restrictive zoning measures or by limiting sewer and water infrastructure. Slowing the number of new roofs and paved driveways, along with smarter landscaping to allow water to soak into the ground, can reduce pollution and stormwater runoff into the waterways that make the coast special.

But nothing yet has slowed the influx of people to the coast. The U.S. Census Bureau says 34 new people move to the Charleston region every day. The Myrtle Beach region annually ranks in the top 5 fastest growing metropolitan areas in the country. And Beaufort County's population jumped from about 125,000 in 2000 to nearly 183,000 in 2016.

Another set of statistics, however, could counter those: A recent U.S. Fish and Wildlife Service survey estimated 744,000 South Carolinians fish, 254,000 hunt, and 1.1 million get out in nature each year simply to enjoy viewing wildlife. The hunting and fishing numbers have leveled off in recent years, but the nature viewing numbers have skyrocketed. As Sandifer notes, the crowds put a stress on wild places, but they also come back with an appreciation for keeping

those places wild.

Then the symbiosis begins again. People who love getting out in natural areas pass on their appreciation for those places to others.

"There's a lot of education that needs to be done," Davidson, the outfitter, says. "And it has to come from us. It can't come from regulators."

It needs to be Davidson explaining the need for oyster restoration to people buying his knives, or Seabrook encouraging a Lowcountry version of shinrin-yoku during outdoor stretching for a yoga class she leads at the Caw Caw Interpretive Center, or Roberts expressing concern about coastal overcrowding while celebrating the natural wonders in her photographs.

"We're at a tipping point," Demosthenes of Lowcountry Land Trust says. "It's imperative that we be proactive with folks who move here, and work with the business community, and with non-traditional stakeholders. We have to stress what everybody has in common.

"Everybody here loves the Lowcountry for the same reason: It's beautiful. We've got to work together to make sure it stays that way."

WHIMSICAL CELEBRATION. *Property managers banned the collection of shells at Botany Bay Beach after early crowds took too many home. Instead, visitors now use the shells to decorate driftwood and palmetto trunks.*
PHOTO/JOEY HOLLEMAN/S.C. SEA GRANT CONSORTIUM

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NEWS & NOTES

S.C., Virginia share coastal flooding experience

The Charleston area in South Carolina and the Hampton Roads region of Virginia have common strengths — vibrant economies, historic neighborhoods, major military installations, and beautiful waterfronts.

They also share a problem, one that threatens all of those strengths — frequent, persistent flooding. That's what prompted the Hampton Roads and Charleston Coastal Resilience Knowledge Exchange June 15-16 in Charleston.

About 60 planners, engineers, emergency managers, non-profit leaders, and corporate officials from the two coastal regions gathered to discuss strategies for dealing with their shared challenge. The event was coordinated by the Charleston Resilience Network (CRN), a public-private collaboration formed in 2015 to foster science-based planning for the area. The S.C. Sea Grant Consortium is one of the network's founding organizations.

Water levels have risen more than a foot in the Charleston harbor in the past century and are forecast to rise another 1.5 to 3 feet in the next 50 years. The Hampton Roads region, which includes the communities of Chesapeake, Hampton, Newport News, Norfolk, Portsmouth, Suffolk, and Virginia Beach, is dealing with similar forecasts.

Nuisance flooding has been on the rise for years in both regions. Extreme astronomical tides as well as persistent weather fronts push seawater into streets, yards, and structures dozens of times each year. Extremely heavy rain events, called rain bombs, can cause minor flooding on their own and catastrophic flooding when combined with extreme tides.

"This is a threat that is creeping up, not coming suddenly," said Brian Swets, planning administrator for Portsmouth, VA. "We don't need to say the sky is falling. We have time to act if we plan responsibly."

Dan Burger, the CRN chair and director of the Coastal Services Division in the Ocean and Coastal Resource Management office of S.C. Department of Health and Environmental Control, said the presentations and discussions at the Knowledge Exchange were just the start.

"We have our work cut out for us," Burger said.

In addition to the Knowledge Exchange, the CRN in early 2016 coordinated a symposium recapping the impacts of, and community response to, the October 2015 floods. More recently, the CRN has facilitated informal gatherings of municipal, state, corporate, and non-profit stakeholders to build network participation and encourage sharing of information on flood-related issues.

For more information about the Knowledge Exchange and the Charleston Resilience Network, visit www.charlestonresilience.net.

Oyster company owner participates in Capitol Hill briefing

The owner of a Beaufort County oyster company explained at a Capitol Hill briefing how S.C. Sea Grant Consortium helped spark recent growth in local shellfish aquaculture.

Frank Roberts examines seed oysters in a barrel at his Lady's Island Oyster facility in Beaufort County.
PHOTO/JOEY HOLLEMAN/S.C. SEA GRANT CONSORTIUM

Frank Roberts of Lady's Island Oyster joined aquaculturists from California, Maine, Michigan, and Mississippi for the June 13 panel "Aquaculture in the United States: Enhancing Growth of the Domestic Industry."

The National Oceanic and Atmospheric Administration's National Sea Grant College Program has backed aquaculture research and development for more than 50 years. From 2012-15, it funded $26 million in aquaculture projects. Another $50 to $100 million in research and development investment is planned in the next decade.

The growth of the oyster industry in South Carolina faced a hurdle when, amid concerns about disease transfer, the state in 2014 introduced a moratorium on oyster seed transfer from all points north of South Carolina.

With help from the Consortium, resource managers identified alterna-

NEWS & NOTES

tive sources of larvae in Louisiana that would meet import requirements. Consortium Living Marine Resources Specialist Julie Davis also provided hatcheries and nurseries with knowledge and tools to spawn and raise South Carolina oyster larvae and seed.

"It was clear that myself and several other growers were going to be out of business if our industry did not have a reliable in-state seed source," Roberts said. "This meant building a hatchery, a daunting task. Sea Grant was the first place our industry looked for help."

Oyster mariculture involves growing hatchery-reared, single-set oysters to harvest size (roughly three inches) in mesh containers raised off the sea floor. Consortium-supported research has introduced growers to the benefits of growing spawnless, or triploid, oysters to provide a consistent meat yield in warmer months.

The state now has 16 oyster growers, with 10 more seeking permits.

In August, growers stopped by Roberts' hatchery to pick up the first batch of hundreds of thousands of baby triploid oysters with exclusively South Carolina roots — both mother and father bred in the state.

Contact Julie Davis at julie.davis@scseagrant.org for more information.

Watson hired as coastal climate and resilience specialist

Sarah Watson has joined the S.C. Sea Grant Consortium and Carolinas Integrated Sciences and Assessments (CISA) as a coastal climate and resilience specialist. Watson's position is jointly supported by the Consortium and CISA, a National Oceanic and Atmospheric Administration-funded research group based at the University of South Carolina.

Sarah Watson
PHOTO/SUSAN FERRIS HILL/S.C. SEA GRANT CONSORTIUM

Watson has a dual Master's degree in Public Policy and City and Regional Planning, with concentrations in climate adaptation and coastal resilience, from Rutgers University, and a B.A. degree in Journalism from Temple University. Most recently, she worked via subcontract with the National Oceanic and Atmospheric Administration's Office for Coastal Management to develop risk communication training materials and other resources for coastal decision-makers. Prior to her career in resilience and climate-change issues, she was an environmental journalist and covered Superstorm Sandy recovery efforts at The Press of Atlantic City in New Jersey.

Watson will address the coastal climate and resiliency needs of a variety of constituencies by extending science-based climate, weather, and resiliency information and providing hands-on operational and technical support to coastal communities, resource managers, and interest groups in South Carolina and the region. She will also contribute to research driven by community needs and provide hands-on operational and technical support for coastal-climate issues addressed by the Consortium and CISA.

Staff win two awards from Community Pride

Community Pride of Charleston County honored S.C. Sea Grant Consortium's Director of Communications Susan Ferris Hill and Marine Educator E.V. Bell at the organization's annual banquet in May.

Ferris Hill was selected for the Captain Pride Award for her work as coastal coordinator of Beach Sweep/River Sweep, South Carolina's largest volunteer-driven litter cleanup.

Since 1988, more than 148,000 volunteers have collected 1,233 tons of debris in the annual litter cleanup on the state's waterways and beaches. And in 2016, the cleanup saved taxpayers $210,000, based on the value of volunteer time.

Beach Sweep/River Sweep is a joint effort of S.C. Sea Grant Consortium and S.C. Department of Natural Resources, and it is held in conjunction with the Ocean Conservancy's International Coastal Cleanup. For information about Beach Sweep/River Sweep, visit www.scseagrant.org/content/?cid=49.

Bell and the team that put together the From Seeds to Shoreline® program were selected for the Johnnie Dodds Education Award.

From Seeds to Shoreline immerses K-12 students in the coastal marsh environment through the cultivation and restoration of *Spartina alterniflora*. Bell coordinates this joint effort with the S.C. Department of Natural Resources and Clemson Extension.

For more information about the From Seeds to Shoreline program, visit www.scseagrant.org/content/?cid=921.

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EBBS & FLOWS

American Meteorological Society Annual Meeting

Austin, Texas
January 7-11, 2018

The meeting will focus on the challenges of communicating emergency actions simply, expressing probability clearly, and honing predictive skills. The organization is marking its 100th anniversary, and communication practices in meteorology have and continue to change. For more information, visit www.annual.ametsoc.org/2018.

National Conference and Global Forum on Science, Policy, and the Environment

Washington, D.C.
January 23-25, 2018

A diverse contingent from academia, business, government, and nonprofits gathers to discuss sustainable infrastructure, resilient communities, and healthy economies. Sessions focus on investments in natural, built, cyber, and social infrastructure. Visit www.ncseconference.org for more information.

2018 Social Coast Forum

Charleston, South Carolina
February 5-8, 2018

Participants from academia, government agencies, and the private sector share how social science tools and data are being used to address the nation's coastal issues, such as climate change and land use planning. Understanding where people live, what they do, and what they value is critical to coastal management. For more information, visit www.bit.ly/2yJenSX.

Subscriptions are free upon request by contacting: Joey.Holleman@scseagrant.org

ATTENTION SCHOOL TEACHERS! The S.C. Sea Grant Consortium has designed supplemental classroom resources for this and past issues of *Coastal Heritage* magazine. *Coastal Heritage Curriculum Connection*, written for K-12 educators and their students, is aligned with the South Carolina state standards for the appropriate grade levels. Includes standards-based inquiry questions to lead students through explorations of the topic discussed. *Curriculum Connection* is available online at www.scseagrant.org/education.

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